Akira NOGUCHI* & Xing-jiang LI**: **Some species of the Pterobryaceous mosses from SW China**

野口 彰*・黎 兴 江**: 中国西南部産ヒムロゴケ科蘚類の数種

The present paper deals with the Pterobryaceous mosses in the Herbarium of Cryptogams, Kunming Institute of Botany, Academia Sinica, China (HKAS), Most of the specimens were collected in SW China by several botanists. Although the collections are not always large, they include several interesting plants. One set of the collections reported was deposited in Herb. Hattori Botanical Laboratory (NICH).

1) **Pterobryopsis orientalis** (C. Muell.) Fleisch., Hedwigia **59**: 217 (1917).

Hab. Yunnan. Kunming City, 1910 m alt., on tree branches, Nov. 1959, Wen-xian Xu 5916; 1950 m alt., on tree branches, Feb. 1955, W.-x. Xu 155; Mar. 1956, W.-x. Xu 15; ann. 1956, Lue-fu Zhou 21222; 2100 m alt., on tree branches, Oct. 1956, W.-m. Zhou 162; 2150 m alt., on rocks, Jan. 1958, W.-m. Zhou 5811; without indication of elevation, on tree branches, Apr. 1956, W.-x. Xu 49; Oct. 1956, W.-m Zhou 168; ann. 1964, W.-x. Xu 6401; on rocks, Nov. 1957, W -x. Xu 0910; Fumin Co. 2210 m alt., May 1963, W.-x. Xu 214; without indication of elevation, on tree branches, May 1963, W.-x. Xu 174, 206; Wuting Co. 2100 m alt., Nov. 1956, W.-x. Xu 26-2; 2250 m alt., on tree branches, Nov. 1964, Q. Yang 26; Jun. 1956, W.-x. Xu 5614; Hsingping Co. 1960 m alt., on tree branches, Jan. 1957, Thin-ying Wang 18. Techung. Autonomous Pref. of Tai and Chingpo Nationality, 960 m alt., on tree branches, Jul. 1956, W.-x. Xu 32, 70.

Distr. NW Himalaya, Sikkim, India, Indochina, China, (Sichuan, Guizou, Xizang, Taiwan).

2) **Pterobryopsis acuminata** (Hook.) Fleisch., Hedwigia **45**: 59 (1905).

Hab. Yunnan. Kunming City, 2100 m alt., on tree branches, Jun. 1962, W.-x. Xu 1040, 7718; Wuting Co. 2300 m alt., on tree branches, Nov. 1956, W.-x. Xu 10; Chinggung Co. 1950 m alt., on tree branches, Apr. 1964, Ji-rou Xeu 22.

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Distr. Nepal, Sikkim, Burma, China (Yunnan, Xizang, Taiwan).

3) **Calyptothecium wightii** (Mitt.) Fleisch., Hedwigia **45**: 62 (1905).

Hab. Yunnan. Hsishuang Panna Autonomous Pref. of Tai Nationality, Mangla Co., 600 m alt., on rocks, Oct. 1980, A. Touw 108, C 112, C 115; Xingjang Li 2334.

Distr. Sri Lanka, India, Nepal, Burma, Thailand, Vietnam, China (Sichuan, Taiwan).

4) **Calyptothecium phyllogonioides** Noguchi et X. J. Li, n. sp. (Fig. 1)

Hab. Yunnan. Hsishuang Panna Autonomous Pref. of Tai Nationality, Mangla

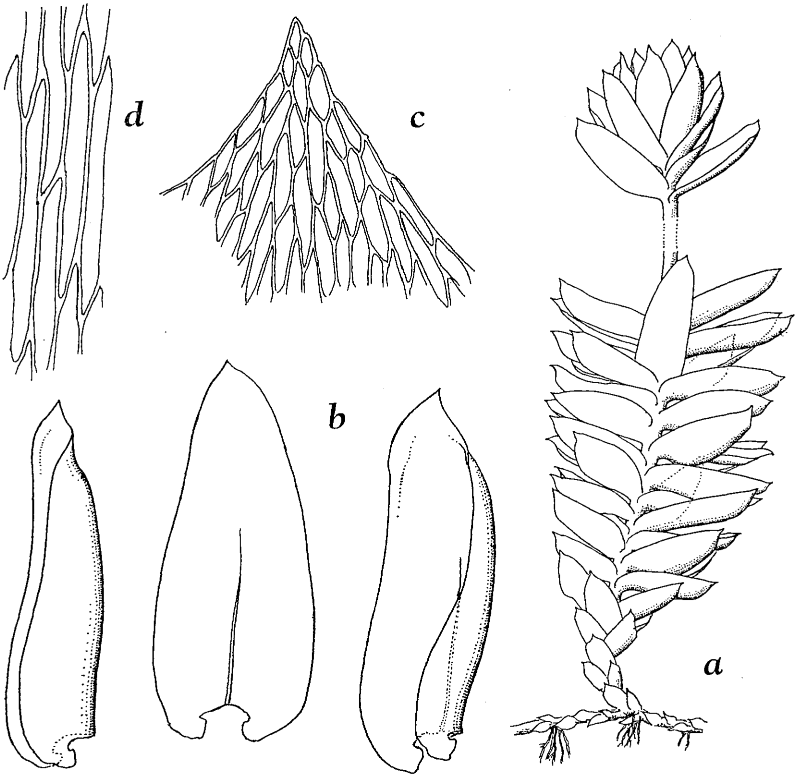

Fig. 1. *Calyptothecium phyllogonioides* Nog. et X. J. Li. a. Part of plant, ×6. b. Leaves of secondary stem, ×20. c. Apical part of stem leaf, ×250. d. Cells from middle of stem leaf, ×385. Holotype (NICH).

Co., 2400 m alt., on rocks, Oct. 1980, X.-j. Li 80-2083 (Holotype in NICH, isotype in HKAS), 20-2424.

Distr. SW China.

Caulis primarius stoloniformis. Caules secundarii erecti, ad 3 cm longi, cum foliis ca 5 mm lati, plerumque simplices, valde complanati, obtusi. Folia caulina disticha, ovato-lingulata, late-acuta, basi auriculata; lateralia valde concava vel conduplicata; dorsalia adpressa, plana; marginibus fere integris; costa simplici, tenui, ad medium folii producta. Cellulae folii medianae lineares, 80-95 μm longae, parietibus tenuibus; superiores breviores.

Plants small, yellowish- or pale-green, slightly glossy. Primary stem stoloniform, creeping, with minute leaves. Secondary stems erect, reddish, to 3 cm long, ca 5 mm thick including leaves, strongly complanate, obtuse at apex, usually simple, occasionally with few short branches. Stem leaves distichous, but several dorsal leaves appressed and flat, ovate-lingulate, widely acute, auriculate at base; lateral leaves strongly concave or conduplicate; margins almost entire or indistinctly crenulate near the apex; costa single, slender, extending to 1/2 the leaf-length. Median laminal cells linear, with acute ends, thin-walled, 80-95 μm long; upper cells shorter.

This species is easily distinguished from the related species of *Calyptothecium* by the distinct distichous foliation. The external appearance is similar to *Phyllogonium*, but the reticulation at the basal angle of leaves is different.

5) **Calyptothecium hookeri** (Mitt.) Broth., Nat. Pfl. 1(3): 839 (1906).

Hab. Yunnan. Hsingping Co. 960 m alt., on tree branches, Jan. 1957, T.-y. Wang 102. Kiangsi Prov. Jinggangshan (Mountain). 1200 m alt, on tree branches, Jun. 1965, Shu-kun Lai 4040.

Distr. Himalayas, SW China and Taiwan, Japan.

6) **Garovaglia crispata** Tix., Ann. Hist. Nat. Mus. Natn. Hung. **66**: 89 (1974). (Fig. 2)

Syn. *Garovaglia latifolia* Broth. et Par. var. *annamensis* Broth. et Par., Rev. Bryol. **38**: 55 (1911).

Hab. Yunnan. He-Kou City, without indication of elevation, on rocks, Nov. 1974, M. Zang 4577, 4608.

Distr. Vietnam, SW China.

Although we have not seen the type specimen of *Garovaglia crispata* Tix., we could not find constant differences between the type specimen of *G. latifolia*

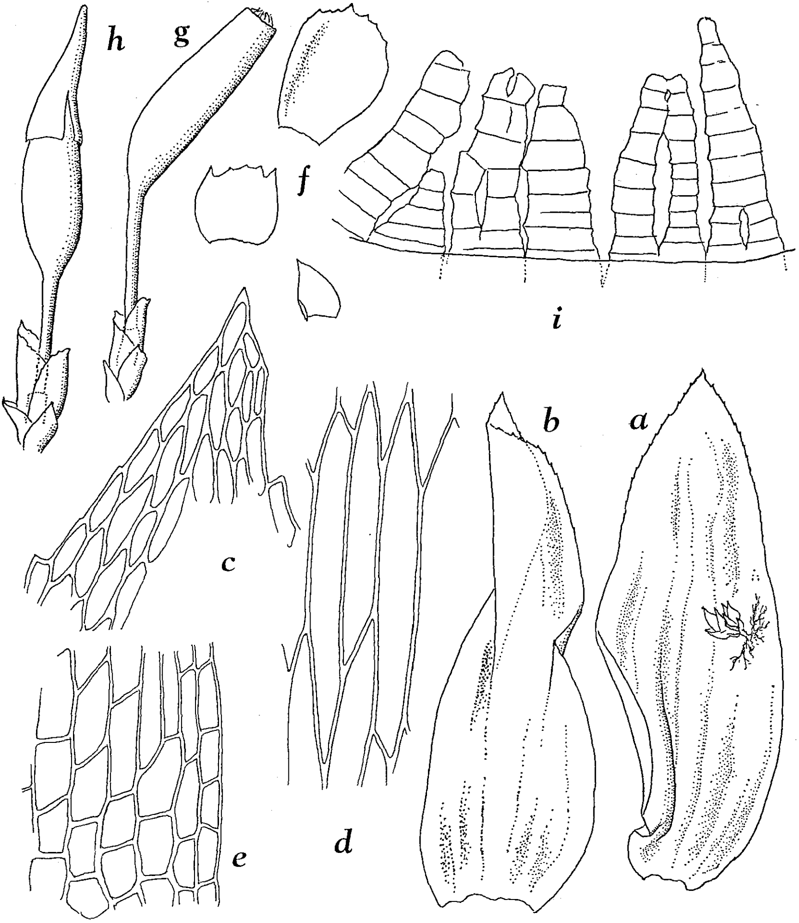

Fig. 2. *Garovaglia crispata* Tix. a, b. Leaves of secondary stem, a bearing dwarf male, ×15. c. Apical part of stem leaf, ×180. d. Cells from middle of stem leaf, ×385. e. Basal angle of stem leaf, ×250. f. Perichaetial leaves, ×20. g, h. Sporophytes and perichaetial leaves, h younger one, ×12. i. Peristome teeth (young), ×250. All drawn from HKAS 4577 (NICH).

var. *annamensis* Broth. et Par. and the Chinese plants reported here, except for the difference in the size of the laminal cells. The laminal cells of the Chinese plants are longer than those of the type specimen of *G. latifolia* var. *annamensis*, being 80-100 μm long in the middle of leaf in contrast to 50-70 μm of the latter. The description of the Chinese plants is given below.

Plants medium-sized, green, slightly glossy. Secondary stems erect, simple, densely leaved. Stem leaves erect-spreading and ± rugose when dry, ovate-oblong, widely acute, not acuminate at apex, to 4.5×1.8 mm, plicate; margins erect, dentate above. Median laminal cells linear-rhomboidal to sublinear, with acute ends, 89–100×8–10 μm, the walls thin, scarcely porose; upper cells shorter; basal cells rectangular or subquadrate, the walls thick, yellowish or brownish; alar cells lax, subquadrate or rectangular. Phyllodioicous. Inner perichaetial leaves small, ca 0.8 mm long, suborbicular, the apex obtuse and erosely toothed. Seta ca 1.5 mm long. Capsules exserted, ± inclined, oblong-cylindric, ca 2.5×0.7 mm. Exostome teeth irregular in outline, smooth, 0.12–0.15 mm long. Calyptra cucullate, not hairy.

7) **Garovaglia elegans** var. **sinensis** Noguchi, var. nov. (Fig. 3)

Hab. Xizang. Medog Co. Dexing, 1700 m alt., on rotten branches, Feb. 1983, Yong-ge Su 3413 (Holotype in NICH, isotype in HKAS).

Planta mediocris. Caules secundarii parce ramosi, ubicumque dense foliosi; folia oblonga, uniformia.

Plants medium-sized, slightly glossy. Secondary stems to 7 cm long, with

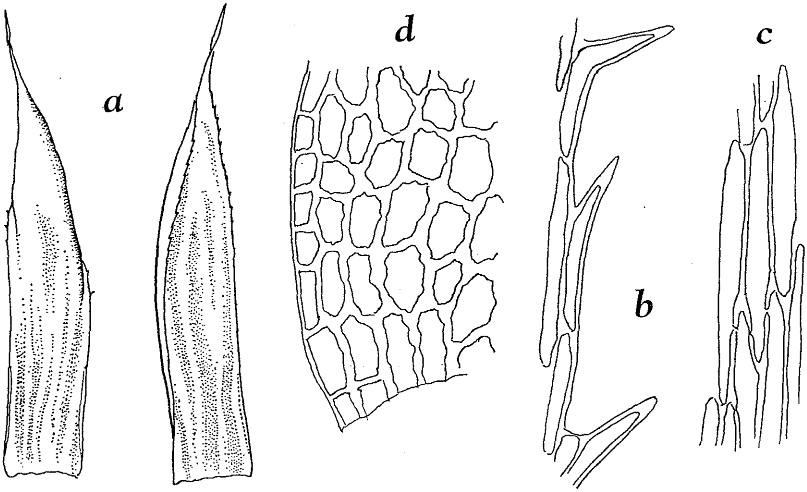

Fig. 3. *Garovaglia elegans* var. *sinensis* Nog. a. Leaves of secondary stem, ×10. b. Apical margin of stem leaf, ×250. c. Cells from middle of stem leaf, ×250. d. Basal angle of stem leaf, ×250. Holotype (NICH).

few branches, arcuate, obtuse at apex, densely leaved throughout. Stem leaves slightly homomallous; lower leaves oblong, gradually tapered to an entire, semi-twisted acumen, to 5×1 mm, concave, distinctly plicate, scarcely rugose; margins erect, spinulose-dentate above except for the acuminated point; costa indistinct. Median laminal cells linear, 100–120×7–9 μm, thin-walled; upper cells shorter; alar cells subquadrate or rectangular, the walls thick and with localized thickenings, brownish. Sporophytes unknown.

8) **Pseudopterobryum tenuicuspes** Broth., Sym. Sin. **4**: 80, pl. 3 (1929).

Syn. *Porotrichum tripinnatum* Dix., Hongkong Natur. supp. **2**: 20, pl. 2 (1933), syn. nov.

Forsstroemia tripinnata (Dix.) Nog., J. Hattori Bot. Lab. **47**: 311, f. 1 (1980).

Hab. Yunnan. Gun Shan, 2200–2500 m alt., Sept. 1940, K.-m. Fang 7263. Sichuan Prov., Mt. Omei, 2000 m alt., on tree branches, Sept. 1977, W.-m. Zhu 1026.

Distr. S China.

The status of *Porotrichum tripinnatum* Dix., reported from SE China has long been puzzling. Noguchi (1980) transferred this species into the genus *Forsstroemia* on a basis of the laminal areolation, but a few years later he found that this was not satisfactory. Now we think that this species is identical with *Pseudopterobryum tenuicuspes* Broth., a curious moss, from China. Although, Brotherus (1929) classed *Pseudopterobryum*, as a new genus in the family Pterobryaceae, the structure of gametophore seems to be remote from the others of that family. But we will follow Brotherus until the sporophytes are found.

We wish to thank Dr. A. J. Sharp of the University of Tennessee for his suggestions concerning the English text.

References

Brotherus, V. F. 1929. Musci. *In* H. Handel-Mazzetti, Symbolae Sinicae, **IV**: 147, Tafel. I–V. Wien. Noguchi, A. 1980. Notulae Bryologicae, X. Journ. Hattori Bot. Lab. **47**: 311–317.

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中国科学院昆明植物研究所に所蔵されているヒムロゴケ科蘚類標本の報告である。4属8種があるが，その中 *Pterobryopsis orientalis, P. acuminata, Calyptothecium wightii, C. hookeri* の4種は東南アジアの熱帯域では珍しいものではない。他の4種の中 *Calyptothecium phyllogonioides*（新種）は，葉が扁平に着いて，あたかも2列に着いているように見えるので *Phyllogonium* 属の蘚類に似た外観を示す。*Garovaglia crispata* は以前に *G. latifolia* var. *annamensis* としてベトナム南部から知られていたもので，種名としては *G. crispata* が用いられる。*Garovaglia elegans* は多型的な種で，チベットの Dexing 産は，第2次茎の上方と下方で同じような葉が同じように密生するもので，その新変種とした。*Porotrichum tripinnatum* は *Pseudopterobryum tenuicuspes* と同種であることがわかった。

□徳田 廣・大野正夫・小河久朗： **海藻資源養殖学** 354 pp. 1987. 緑書房，東京. ￥5500. 生活史の解明に伴い海藻の養殖技術が飛躍的に進歩してきた。生活史解明の手がかりが得られた昭和24年当時は年間生産高が10億枚にも満たなかった浅草海苔が，貝殻を穿孔する胞子体の発見から，人工タネ付け，タネの人工保存など，新しい技術が次々と開発され，昭和40年代後半には60億枚から100億枚に達するようになったのはその良い例である。海藻の養殖技術の小冊子はかなりの数刊行されているが，生活史，生理，生態なども取り入れた，いわば理論と実際を総括的に記述した本はなく，その出現が待たれていた。三人の水産植物学者がこの願いを満たしてくれた。本書は9章から成る。1章. 地球の生態系と海藻，2章. 生育環境，3章. 海藻の利用，4章. 海藻資源と生産量，5・6章が主章で，5章で有用海藻ヒトエグサ，アオノリ，コンブ，ワカメ，ヒジキ，マツモ，アマノリ（アサクサノリ），フノリ，テングサの生活史，生態，養殖法，将来の展望などが，6章でアラメ，カジメ，ホンダワラ類，アマモ類など，藻場植物の生活史，藻場造成法などが詳述される。続く7章は海外の海藻養殖の現状，8章は海藻養殖の将来と展望，9章は品種の育成，バイオテクノロジーなどである。最近，海外でも海藻養殖や藻場造成が注目されるようになったが，現状ではこの方面の知識や技術は日本の独壇場である。引用の研究データ，統計資料及び文献は豊富であり，巻末には150余の用語の解説が付される。水産に携わる人以外にも参考書・啓蒙書として薦められる。 （千原光雄）